LAWRENCE LIVERMORE
REPORT

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory, May 17-24, 2010

Vitamins on a mission

Ever wonder how your body actually uses your daily multi-vitamin?

Lab researchers are interested in knowing, too. "This has been a particularly difficult problem because vitamins are present at really, really low concentrations in our bodies and in really small amounts of food. So, it's hard to measure," said Lab researcher Ken Turteltaub.

Using accelerator mass spectrometry makes it a lot easier because the process makes very precise measurements of minute amounts of say, a vitamin.

"You can make very specific studies right in people and estimate what they need. And you can even get to looking at groups that may need more vitamins -- certain vitamins -- than others," Turteltaub said.

To read more or listen to an interview, go to http://www.ucop.edu/sciencetoday/article/23387

This is your brain under fire

It's been well known to doctors worldwide that the effect of blasts on soldiers' brains was unknown. But Lab physicist Willy Moss and LLNL engineer Mike King have used computers to simulate how explosions damage soldiers' brains. They hope it encourages the military to develop better combat helmets and ultimately prevent many traumatic brain injuries, or TBI, in soldiers.

Blasts are a leading cause of TBI for military personnel in war zones, according to the Brain Injury Association of America. The U.S. Department of Defense reported that 30 percent of patients with combat-related injuries seen at Walter Reed Army Medical Center from 2003 to 2008 were diagnosed with TBI. There have been more than 160,000 cases of TBI within the U.S. military over the past decade, with an annual rate that has nearly doubled.

"Blasts are only just now coming into the collective consciousness of the military," Moss says.

To read more, go to http://www.mercurynews.com/california/ci_15051660?nclick_check=1

Garamendi on board for open campus project

Congressman John Garamendi discusses the Livermore Valley Open Campus (LVOC) during a recent press conference.

Rep. John Garamendi and Congressman Jerry McNerney recently introduced to Congress a bill that would help the Livermore Valley Open Campus (LVOC) become a reality.

Last year, the National Nuclear Security Administration (NNSA) announced the first step toward the creation of the LVOC, a joint venture between Sandia National Laboratories and Lawrence Livermore to promote greater collaboration between the world-class scientists at the nuclear security labs and their partners in industry and academia.

Open access to the LVOC by the international science community would directly support the advancement of Sandia's Hub for Innovation in the Transportation Energy Community (HITEC), promote key LLNL programs such as the National Ignition Facility (NIF) and its high-energy density research, expand the high-tech "footprint" of the Bay Area and establish the Livermore Valley as the high-tech anchor of the East Bay.

To read more, go to
http://www.independentnews.com/uploads/pdf/1_13052010_1274404286.pdf

I.D. the bugs in 24 hours

LNL biologist Crystal Jaing is shown loading a fluorescently-labeled viral DNA sample onto the Lawrence Livermore Microbial Detection.

Lab scientists have developed technology that can identify bacteria, viruses and other organisms within 24 hours.

The technology -- the Lawrence Livermore Microbial Detection Array -- will be of value in detecting bioterrorism attacks, diagnosing diseases and checking product safety.

"The (array) allows us to not only identify the biological pathogens on a priority screening list, but also any other already-sequenced bacteria or virus in a sample that you might not have

been expecting to find, including possible novel or emerging pathogens," said Tom Slezak, LLNL's associate program leader for informatics.

To read more, go tohttp://www.upi.com/Science_News/2010/05/11/Technology-IDs-pathogens-within-24-hours/UPI-54741273607264/

Fueling up the crops

Who says that corn can't be put to good use other than for eating at a summer barbecue?

Lawrence Livermore and Sandia researchers say it can be, but first you must understand the key elements of biofuel combustion before selecting next-generation alternative fuels.

Sandia researcher Nils Hansen and Lawrence Livermore scientist Charles Westbrook point out that while bioethanol, biobutanol and biodiesel are gaining interest as alternatives to oil-based transportation fuels, little research has been done on what happens in biofuel combustion.

To read more, go to http://www.upi.com/Science_News/2010/05/12/Biofuel-combustion-research-needed/UPI-93911273692963/

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NEWSLINE

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Photo of the week

So hot, it's cool: Summer students like Harold Irwin from Hilo, Hawaii are starting to arrive at the Lab. Irwin is spending his summer internship with Plant Engineering getting hands-on experience working with the HVAC (Heating, Ventilating and Air Conditioning) systems throughout the Lab's site.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

To send input to the Livermore Lab Report, send e-mail mailto:labreport@llnl.gov.

The *Livermore Lab Report* archive is available at:
https://publicaffairs.llnl.gov/news/lab_report/2010index.html